Diet of Arctic Wolves on Banks and Northwest Victoria Islands, 1992-2001

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ABSTRACT

As part of a larger study, wolf stomachs were collected from entire wolf carcasses collected by local harvesters from Sachs Harbour (71°59'N 125°15'W) on Banks Island from 1992-2001, and from Ulukhaktok, formerly Holman (70°45'N 117°42'W) on Northwest Victoria Island from 1998-2001. Wolf scats were collected opportunistically during field research trips conducted on Banks Island from 1993-2001 and on Northwest Victoria Island from 1998-1999. A total of 129 stomachs and 38 scats from Banks Island, and 30 stomachs and two scats from Northwest Victoria Island were analyzed macro and microscopically for hair, feather, and bone fragments of prey items. Prey items were identified as closely as possible to species. Seventeen stomachs were empty. Remains of muskoxen (*Ovibos moschatus*) predominated being found in 90% of 115 and 88% of 27 stomachs from Banks Island and Northwest Victoria Island, respectively, and 87% of 38 and 100% of two scats from Banks Island and Northwest Victoria Island, respectively. Peary caribou (*Rangifer tarandus pearyi*), collared lemming (*Dicrostonyx torquatus*), Arctic hare (*Lepus arcticus*), Arctic fox (*Alopex lagopus*), snow goose (*Chen caerulescens*), ptarmigan (*Lagopus* spp.), and plant material were also found in stomachs and scats; however, only Peary caribou and collared lemming occurred in ≥5% of either stomachs or scats.

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INTRODUCTION

There is limited information on the status of Arctic wolves inhabiting the Canadian Arctic Archipelago, particularly in the NWT. The Inuvialuit harvest study documented wolf harvest in the Inuvialuit Settlement Region (ISR) starting in 1987. Beginning in 1992, the Department of Environment and Natural Resources (ENR) began documenting wolf harvest and, as part of a larger study, began collecting harvested wolf carcasses and wolf scats from Banks Island, NWT. In 1998, ENR began collecting harvested wolf carcasses and wolf scats from Northwest Victoria Island, NWT. Trappers were reimbursed for carcasses that were submitted. Carcass collection for this study continued at least through winter 2001/02.

Nagy and Larter (2000) provided a preliminary analysis of the harvest and diet information from this study. This report provides a more thorough analysis and description of the contents of the stomachs and scats collected from Arctic wolves from Banks Island, during November 1992 to April 2001, and from Northwest Victoria Island, during May 1998 to May 2001.

STUDY AREA

The study area included all of Banks Island and Northwest Victoria Island. Local trappers from the communities of Sachs Harbour and Ulukhaktok harvested wolves throughout the area shown in Figure 1.

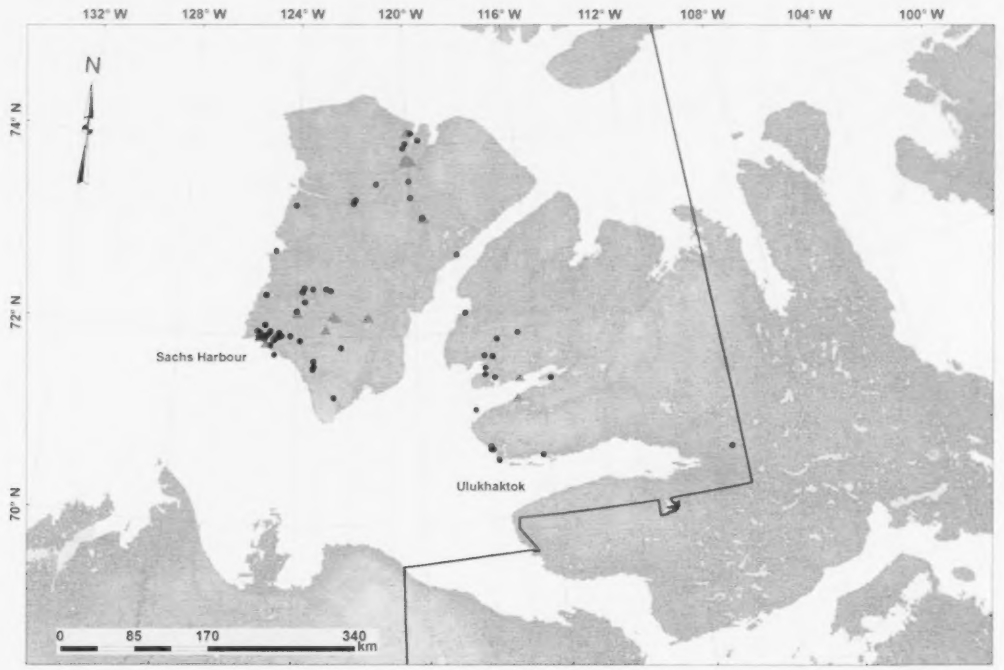

Figure 1. The study area of Banks Island and Northwest Victoria Island. ● indicates locations of harvested wolves; ▲ indicates locations of wolf scat collection.

METHODS

As part of a larger study, wolf scats were collected opportunistically during field research trips conducted on Banks Island from 1993-2001 and on Northwest Victoria Island from 1998-1999. Additionally, wolf stomachs were collected from entire wolf carcasses provided by local harvesters from Sachs Harbour (71°59'N 125°15'W) on Banks Island from 1992-2001, and from Ulukhaktok (formerly Holman) (70°45'N 117°42'W) on Northwest Victoria Island from 1998-2001. The location of wolf scats was recorded by a handheld global positioning system (GPS). The location of most harvested wolves was marked on a map provided by the hunter. A latitude and longitude was transcribed from the map. There was no location data provided for 13 stomach samples from Banks Island.

Wolf scats and stomachs were kept frozen before being forwarded to the lab for analysis. Macro and microscopic prey items were identified as closely as possible to species by the analysis of hair, feather, and bone fragments.

RESULTS

A total of 129 stomachs and 38 scats from Banks Island, and 30 stomachs and two scats from Northwest Victoria Island were analyzed for their content. Fourteen wolf stomachs from Banks Island and three wolf stomachs from Northwest Victoria Island were empty. Of the 115 and 27 stomachs containing food items from Banks Island and Northwest Victoria Island specimens, respectively, 90% and 88% contained muskox (*Ovibos moschatus*, Table 1). Additionally, 33 of 38 (87%) scats from Banks Island and both scats from Northwest Victoria Island contained muskox. Seven other different food items were found in stomachs and scats including Peary caribou (*Rangifer tarandus pearyi*), collared lemming (*Dicrostonyx torquatus*), Arctic hare (*Lepus arcticus*), Arctic fox (*Alopex lagopus*), snow goose (*Chen caerulescens*), ptarmigan (*Lagopus* spp.), and plant material (Table 1). However, only Peary caribou and collared lemming occurred in ≥5% of either stomachs or scats.

Table 1. Frequency occurrence of the different identifiable food items found in the stomachs and scats of Arctic wolves from Banks Island (n=115 stomachs, n=38 scats) and Northwest Victoria Island (n=27 stomachs, n=2 scats). Empty stomachs are not included in the sample size.

	Banks Island		Northwest Victoria Island	
Food Item	Stomach	Scat	Stomach	Scat
Muskox	103	34	26	2
Peary Caribou	8	0	3	0
Collared Lemming	13	11	3	0
Arctic Hare	1	1	1	0
Arctic Fox	4	0	1	0
Snow Goose	4	2	0	0
Ptarmigan spp.	1	0	0	0
Plant	2	3	0	0

DISCUSSION

In this study identifiable gut contents were documented from 142 wolves; contents were identified for an additional 40 scats collected opportunistically. Prey types were consistent with those reported for other high Arctic wolf populations (Mech 2005, 2007a, b). Wolves are typically apex predators throughout their range and primarily feed on large social ungulates that live in herds (Pimlott 1967, Kuyt 1972, Mech 1974, Ballard et al. 1997) which they hunt by wearing them down in short chases (Gray 1970, Mech 2007b, MacNulty et al. 2009). In this study, muskox remains predominated in the stomachs and scats of sampled wolves.

Patterns of wolf food selection are probably influenced by resource availability and habitat characteristics (Mech 2005, 2007a), and for the wolves sampled in this study area the availability of muskox prey was high. The muskox population on Banks Island was estimated at 49,000-68,000 during the sampling period (Larter and Nagy 2001a, Nagy et al. 2009a). The muskox population on Northwest Victoria Island was estimated at 18,000-19,000, from 1998-2001 (Nagy et al. 2009b). The much lower occurrence of Peary caribou in the stomachs (7-11%) and scats (0%) of wolves likely reflects the difference in the abundance of this large ungulate prey relative to muskoxen on both Banks Island and Northwest Victoria Island. Peary caribou numbers were estimated at 450-1,150 during the sampling period on Banks Island and 100-200 from 1998-2001 on Northwest Victoria Island (Nagy et al. 2009a, b). However, wolves

on Victoria Island also have the opportunity to prey on Dolphin-Union caribou which are found in greater abundance than Peary caribou there (Nagy et al. 2009b).

In the Queen Maud Gulf Bird Sanctuary caribou are the main prey of wolves, however wolves also preyed heavily on seasonally abundant flightless birds that were nesting in large numbers in dense colonies (Wiebe et al. 2009). During summer, hundreds of thousands of snow geese are present on Banks Island (Samelius et al. 2008, Larter and Nagy 2001b). My findings indicate that these birds are preyed upon, but to a limited extent. Local and scientific knowledge indicate that the numbers of Arctic hares show periodic highs (Larter 1999) and lemmings have shown cyclical highs (Larter 1998). The frequency occurrence of lemmings in all stomachs (11%) and all scats (28%) indicates that small mammals are certainly preyed upon, but muskox was the major food item sustaining wolves in the study area.

The reproductive success of wolves may be influenced by availability of certain prey items. Mech (2005) found on Ellesmere Island that wolf presence and reproduction appeared to be more dependent on muskoxen increase than on Arctic hare increase. However, in part of Ellesmere Island the number of wolf pups and adults did not correlate with muskox numbers, but they were positively related to Arctic hare index (Mech 2007a). Nevertheless, muskoxen are known to be an important resource to Arctic wolves, both as food sources (Mech 2007a, b) and as temporary rendezvous sites for pups (Gray 1993).

Wolf numbers, based upon harvest and observations were believed to be higher at the end of the study than at its beginning (Nagy and Larter 2000). Whether muskox numbers were at a level that maintained or may have increased wolf numbers to levels that may have contributed to the decline in Peary caribou populations on Banks Island and Victoria Island during the study period is unknown.

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LITERATURE CITED

Ballard, W.B., L.A. Ayres, P.R. Krausman, D.J. Reed and S.G. Fancy. 1997. Ecology of wolves in relation to migratory caribou herd in northwest Alaska. Wildlife Monograph 135:3-47.

Gray, D.R. 1970. The killing of a bull muskox by a single wolf. Arctic 23(3):197-199.

Gray, D.R. 1993. The use of muskox kill sites as temporary rendezvous sites by Arctic wolves and pups in early winter. Arctic 46(4):324-330.

Kuyt, E. 1972. Food habits and ecology of wolves on barren-ground caribou range in Northwest Territories. Canadian Wildlife Service Report Series Number 21. 36pp.

Larter, N.C. 1998. Collared lemming abundance, diet, and morphometrics on Banks Island, 1993-1996. Resources, Wildlife & Economic Development, Government of the Northwest Territories. Manuscript Report Number 107. 21pp.

Larter, N.C. 1999. Seasonal changes in Arctic hare, *Lepus arcticus*, diet composition and differential digestibility. Canadian Field-Naturalist 113(3):481-486.

Larter, N.C. and J.A. Nagy. 2001a. Calf production, calf survival, and recruitment of muskoxen on Banks Island during a period of changing population density from 1986-99. Arctic 54(4):394-406.

Larter, N.C. and J.A. Nagy. 2001b. Seasonal and annual variability in the quality of important forage plants on Banks Island, Canadian High Arctic. Applied Vegetation Science 4(1):115-128.

MacNulty, D.R., D.W. Smith, D.L. Mech and L.E. Eberly. 2009. Body size and predatory performance in wolves: is bigger better? Journal of Animal Ecology 78:532-539.

Mech, D.L. 1974. *Canis lupus*. Mammalian Species 37:1-6.

Mech, D.L. 2005. Decline and recovery of a high Arctic wolf-prey system. Arctic 58(3):305-307.

Mech, D.L. 2007a. Annual arctic pack size related to Arctic hare numbers. Arctic 60(3):309-311.

Mech, D.L. 2007b. Possible use of foresight, understanding, and planning by wolves hunting muskoxen. Arctic 60(2):145-149.

Nagy, J.A. and N.C. Larter. 2000. Status and diet of Arctic wolves (*Canis lupus arctos*) in the Inuvialuit Settlement Region, Arctic Canada. *Abstract only*. Beyond 2000 Realities of Global Wolf Restoration. University of Michigan, Duluth, MN. pg. 91.

Nagy, J.A., N.C. Larter and W.H. Wright. 2009a. Population estimates for Peary caribou and muskox on Banks Island, Northwest Territories, July 2001. Environment and Natural Resources, Government of the Northwest Territories. Manuscript Report Number 199. 37pp.

Nagy, J.A., N.C. Larter and W.H. Wright. 2009b. Population estimates for Peary caribou (Minto Inlet Herd), Dolphin and Union caribou and muskox on Northwest Victoria Island, Northwest Territories, July 2001. Environment and Natural Resources, Government of the Northwest Territories. Manuscript Report Number 202. 36pp.

Pimlott, D.H. 1967. Wolf predation and ungulate populations. American Zoologist 7(2):267-278.

Samelius, G., R. Alisauskas and J. Hines. 2008. Productivity of lesser snow geese on Banks Island 1995 to 1998. Canadian Wildlife Service, Ottawa, ON. Occasional Paper No. 115: 35pp.

Wiebe, N., G. Samelius, R.T. Alisauskas, J.L. Bantle, C. Bergman, R. De Carle, C.J. Hendrickson, A. Lusignan, K.J. Phipps and J. Pitt. 2009. Foraging behaviours and diets of wolves in the Queen Maud Gulf Bird Sanctuary, Nunavut, Canada. Arctic 62(4):399-404.